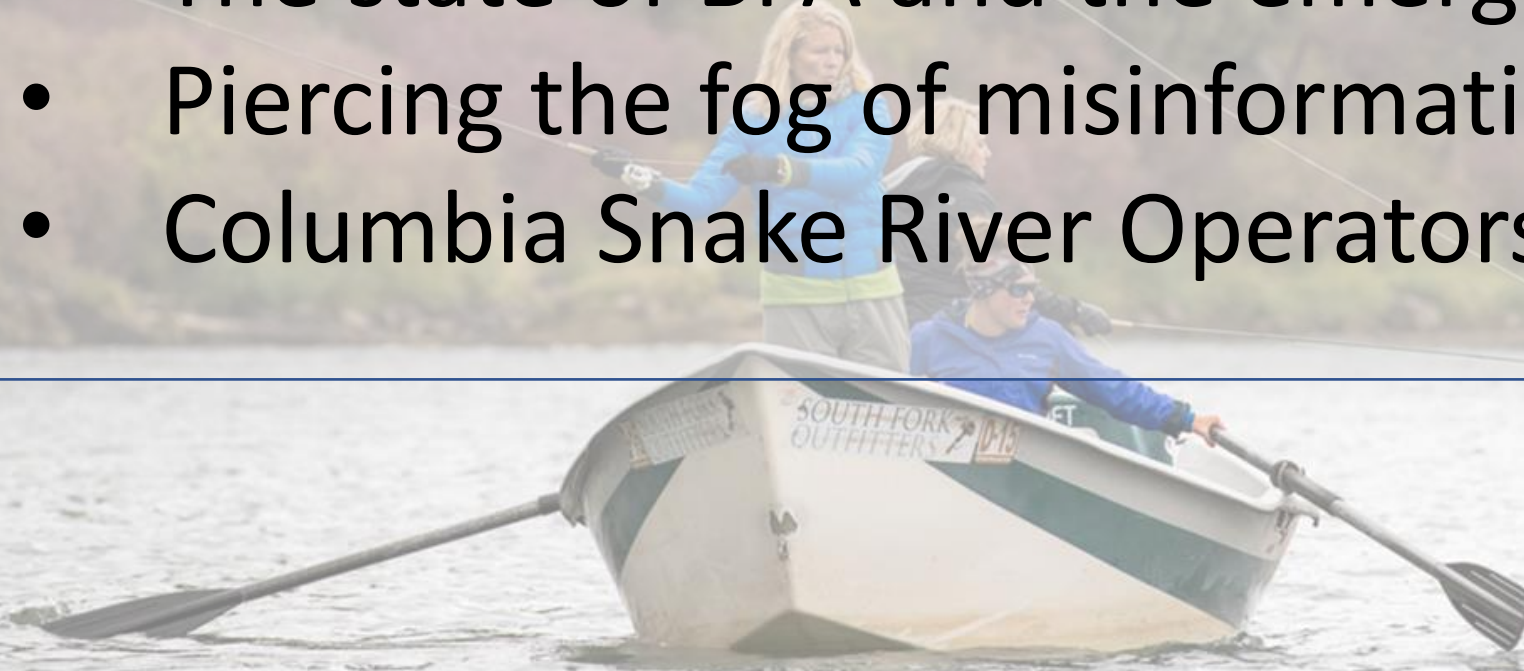


# Salmon and Steelhead: A New Perspective



# Agenda

- Idaho Wildlife Federation Intro
- The Governor's Salmon Workgroup
- What is killing our fish?
- The state of BPA and the emerging opportunity
- Piercing the fog of misinformation
- Columbia Snake River Operators DEIS









A person wearing camouflage clothing is holding a large fish, likely a steelhead, in a body of water. The fish is silver with a pinkish-red hue on its underside. The person's hands are visible, holding the fish from below. The background shows the water and some of the person's gear.

# IWF's advocacy for salmon and steelhead

- Brought anglers/guides to meet with high level state gov. officials (4 years)
- Forming the Gov's Salmon Workgroup was a direct ask of IWF
- Organizing river communities
- Producing media for mass public education



Before we jump in...



This is one of the most complex environmental, political, and economic issue in American history

We've learned this info over four years. There is more to unravel. We're trying to condense to 30 mins. You will have questions.



A person wearing camouflage clothing is holding a large fish in the water. The background is slightly blurred, showing the water and the person's hands holding the fish.

# The Governor's Salmon Workgroup

- Diverse set of stakeholders
- Hear diverse perspectives on issues
- Establishing baseline science
- Identify false or flagrant info/narratives
- What is really killing our fish
- Discuss solutions to recover fish



A person with long blonde hair, wearing a red shirt and grey waders, is fly fishing in a river. The fishing line is arched in the air. In the background, there are green trees and blue mountains under a clear sky. A fish is visible jumping out of the water in the middle ground.

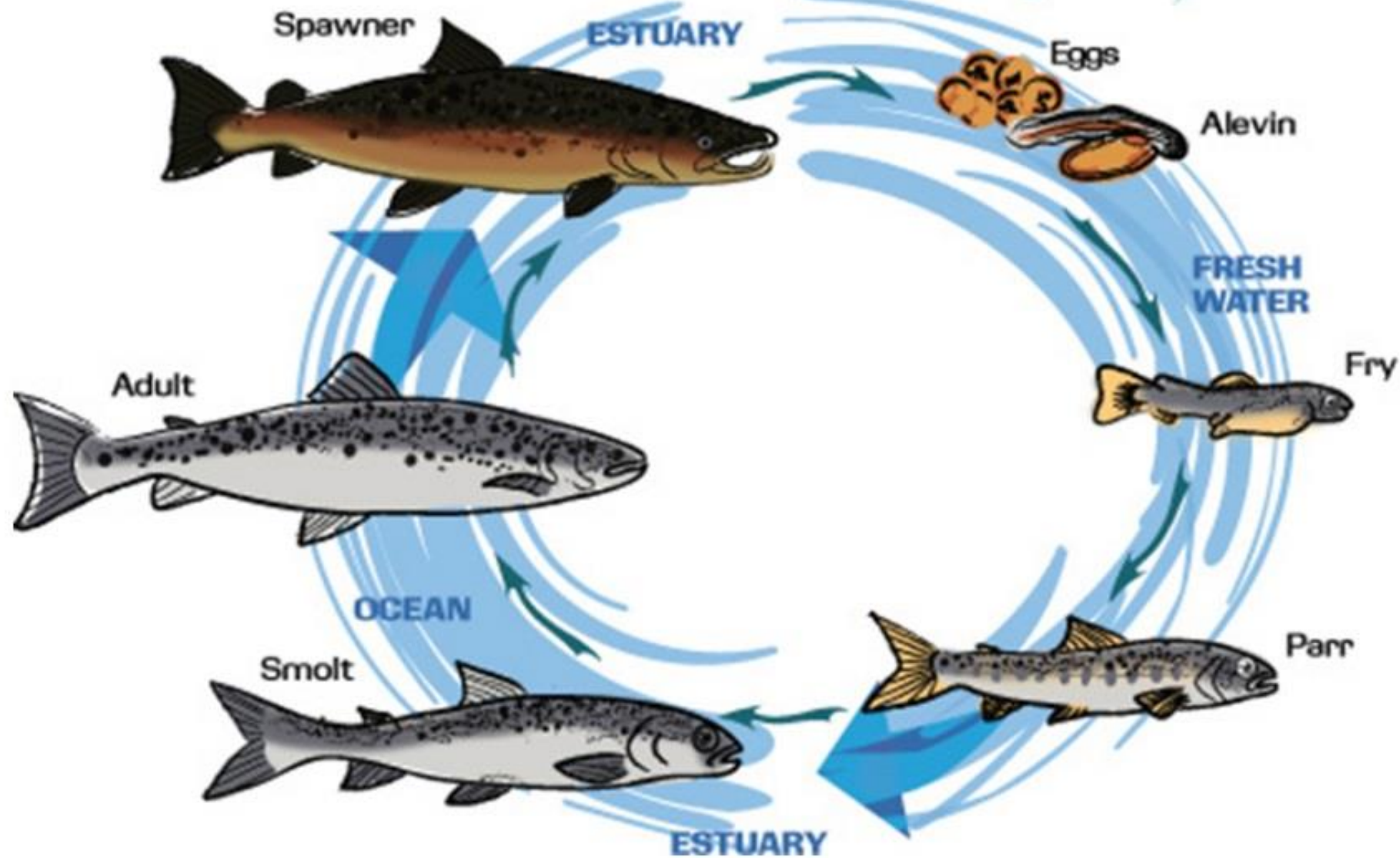
What is killing our fish?

First, a quick recap on fish lifecycles

Then we need to understand tools and indicators for measuring survival

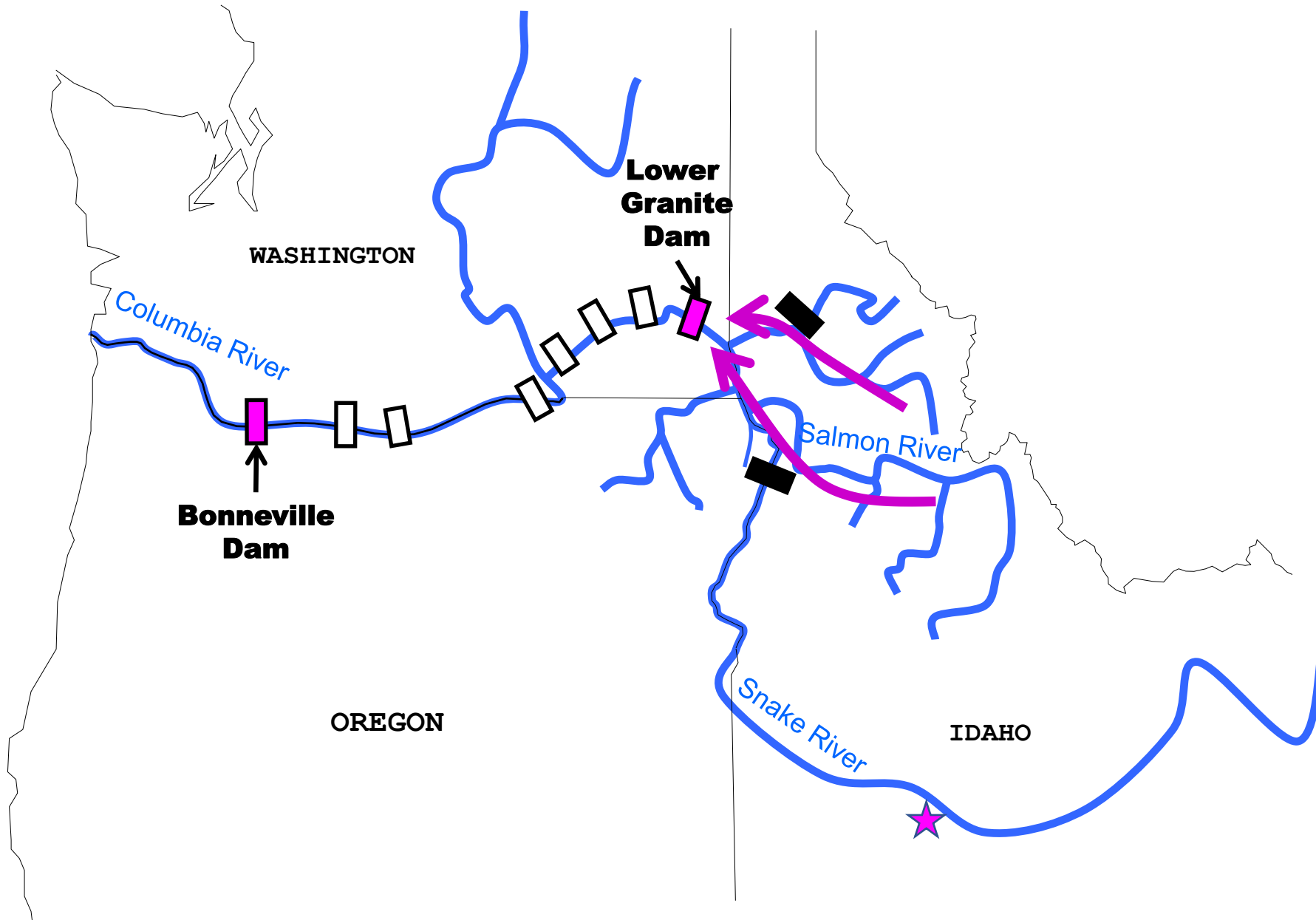


# Life Cycle of the Salmon



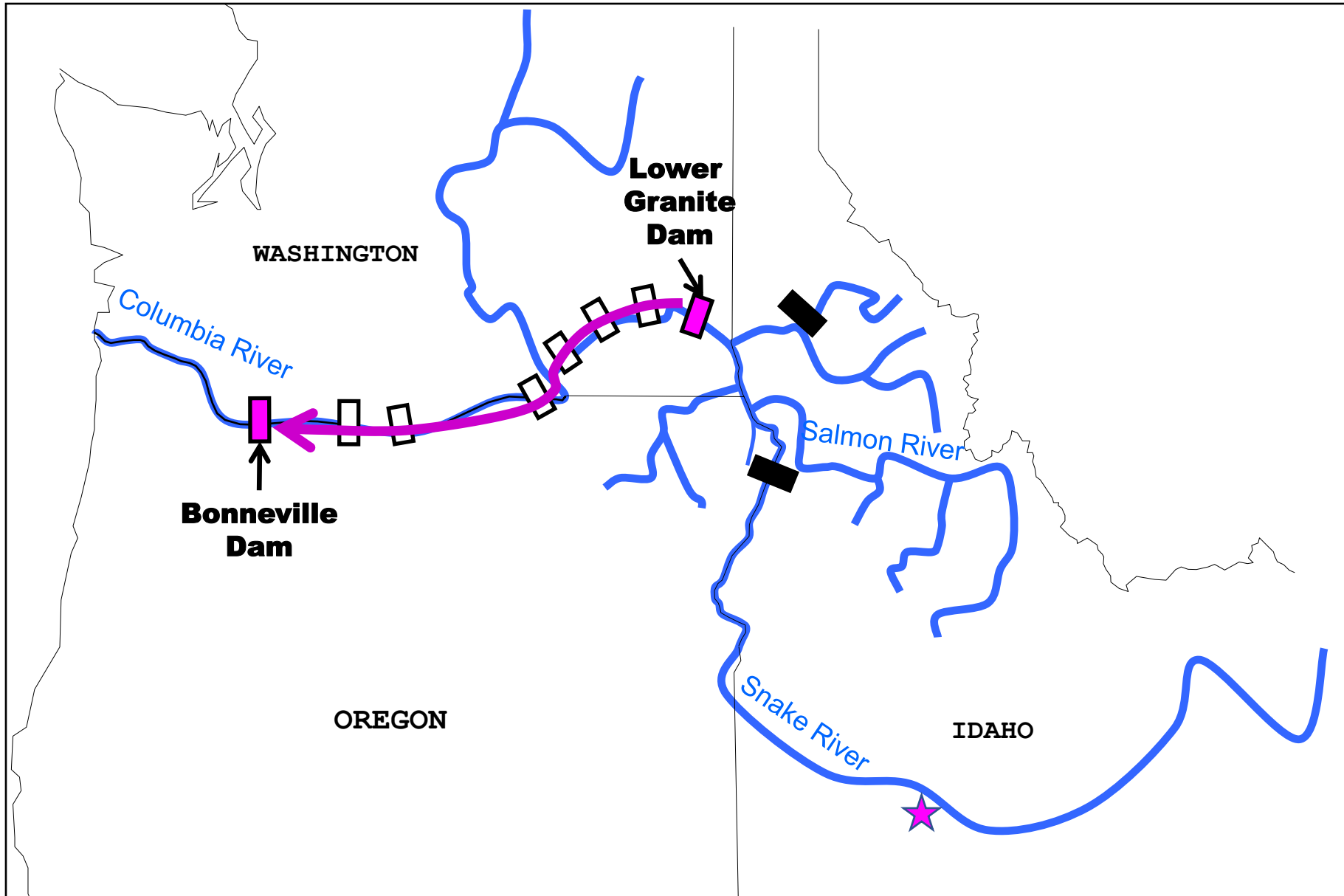


# Smolt Emigration



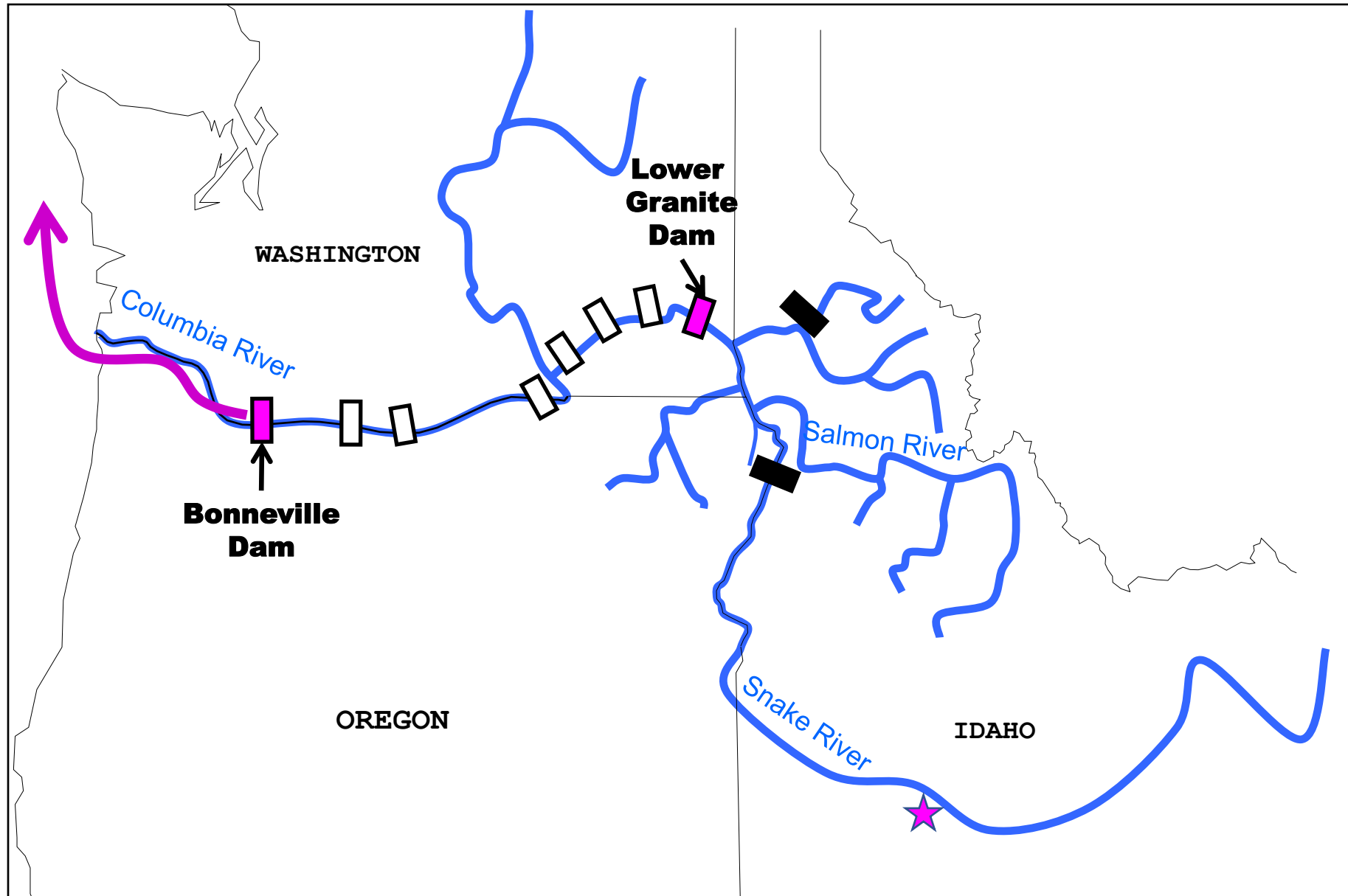


# Passage Through Hydrosystem





# Estuary & Near Shore



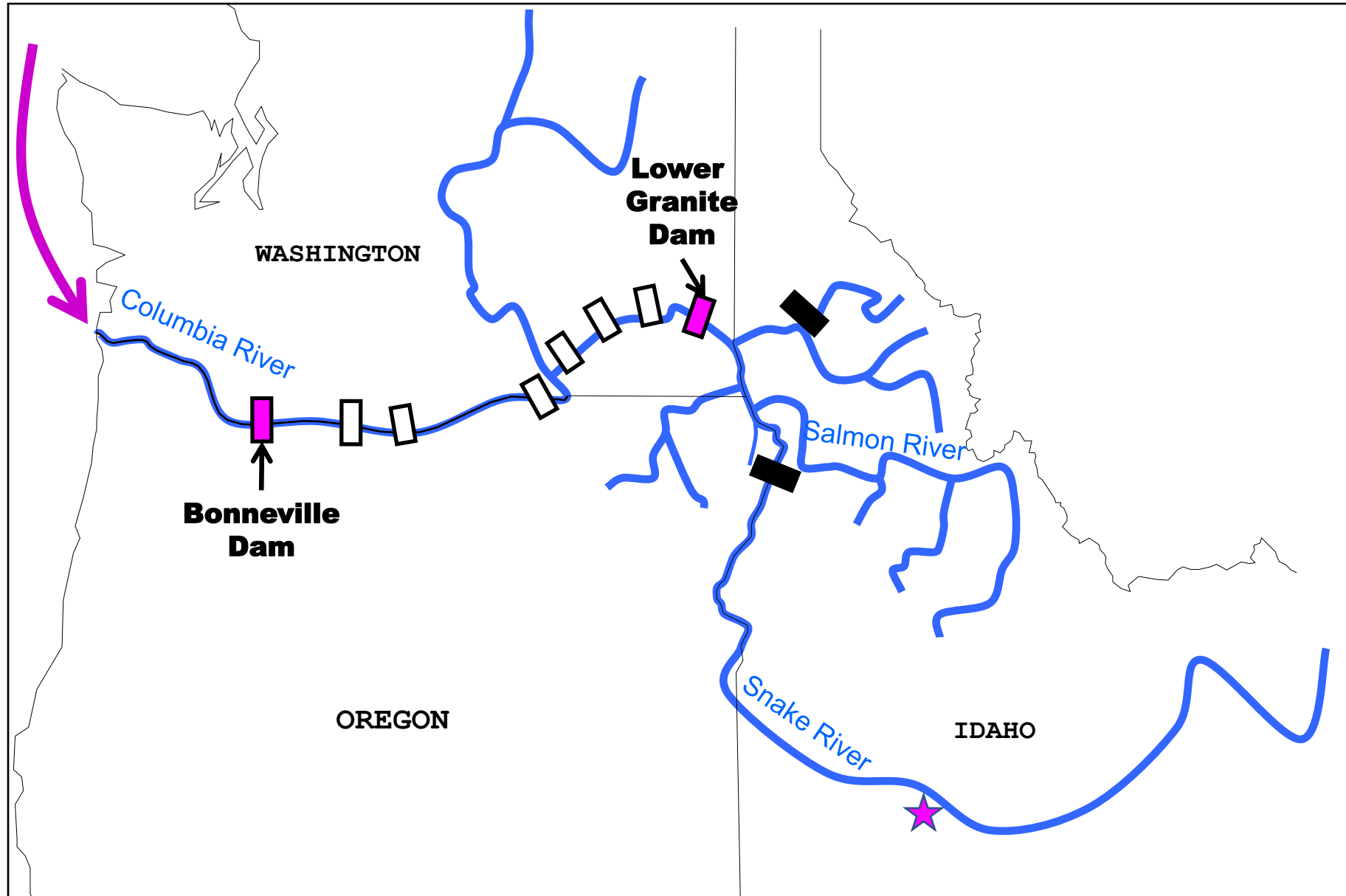




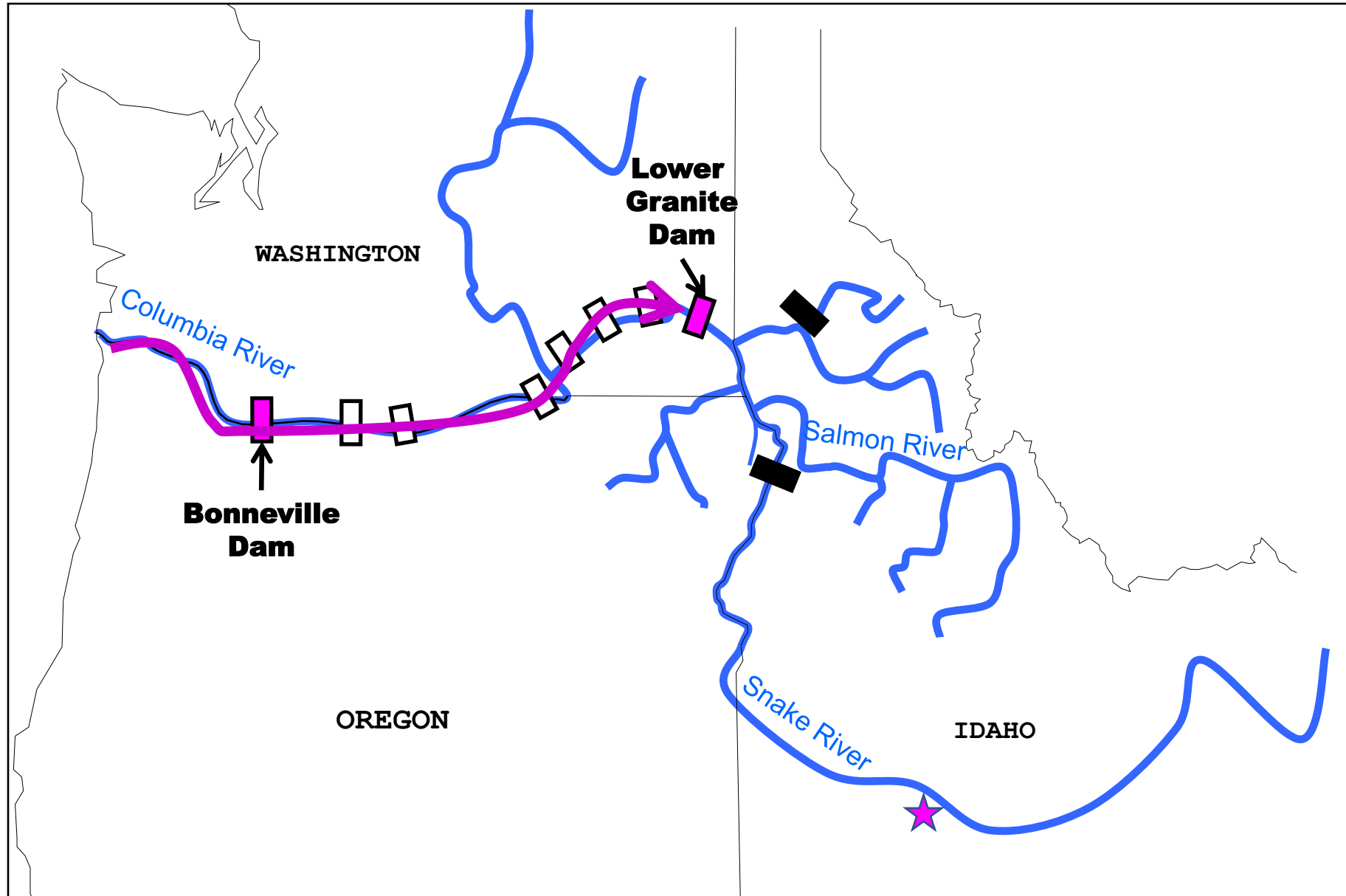
*General migratory pattern of pacific salmon.*



# Return from the Ocean



# Return to Idaho







## Measuring Returns: SARs (Smolt to Adult Return Ratio)

- Survival from beginning point as a smolt to ending point as an adult
- Must be between 2-6% to sustain #s
- $<2\%$  = population declines
- $4\%$  = necessary for harvestable
- $6\%$  = historic levels and true abundance

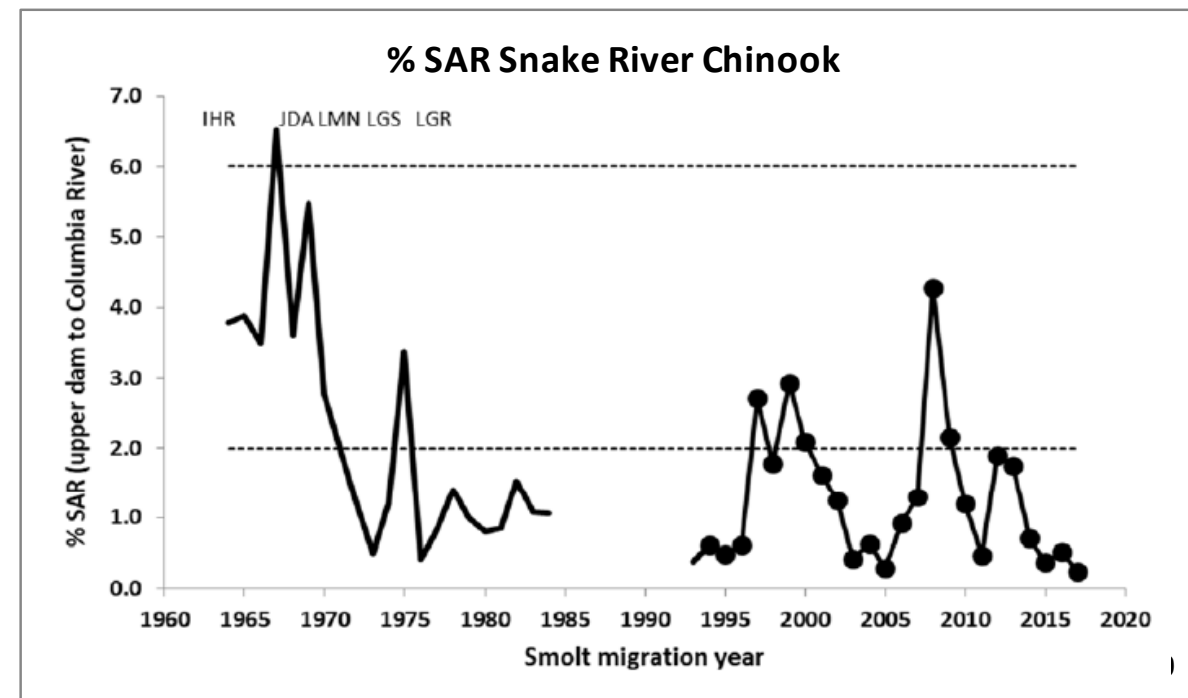
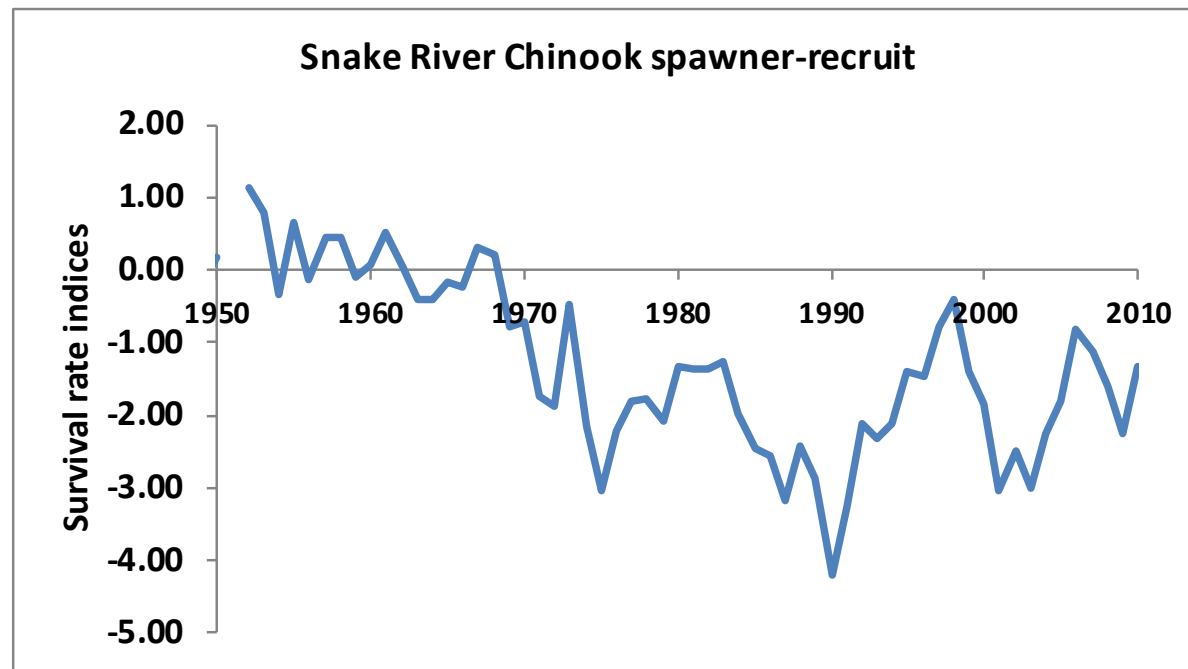


A person wearing camouflage clothing is holding a large rainbow trout in a body of water. The fish is vibrant with pink and orange hues along its side. The background shows the person's gear and the rippling water.

# Measuring Returns: SARs

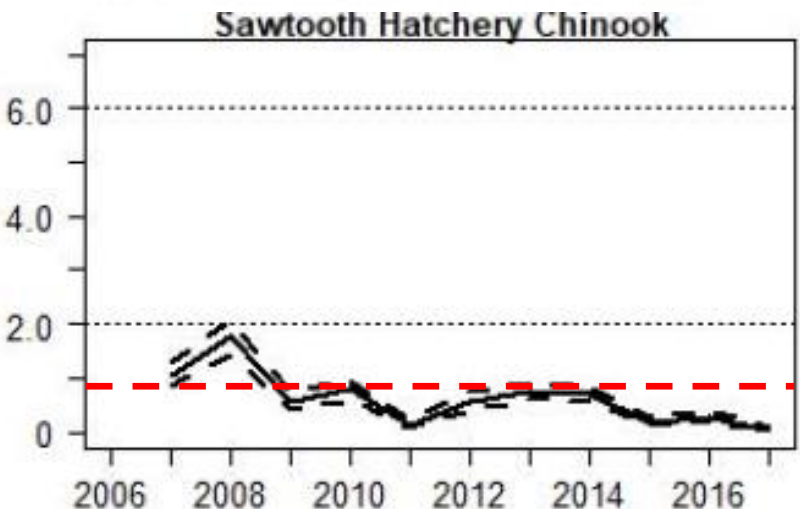
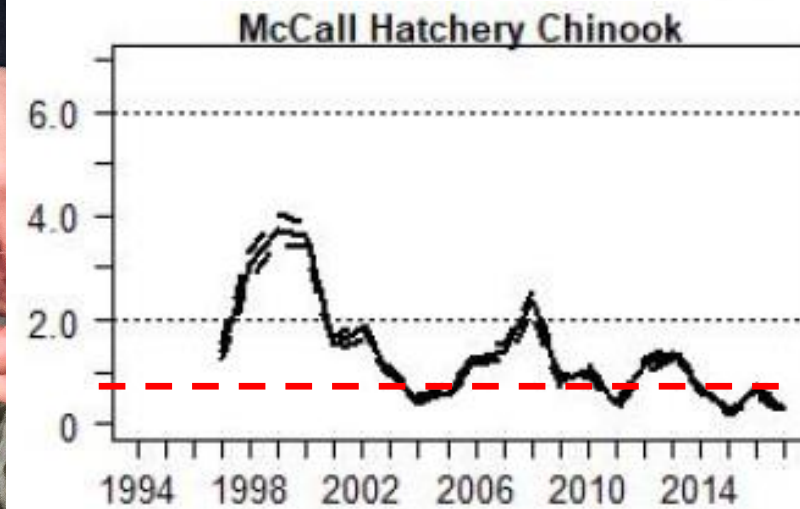
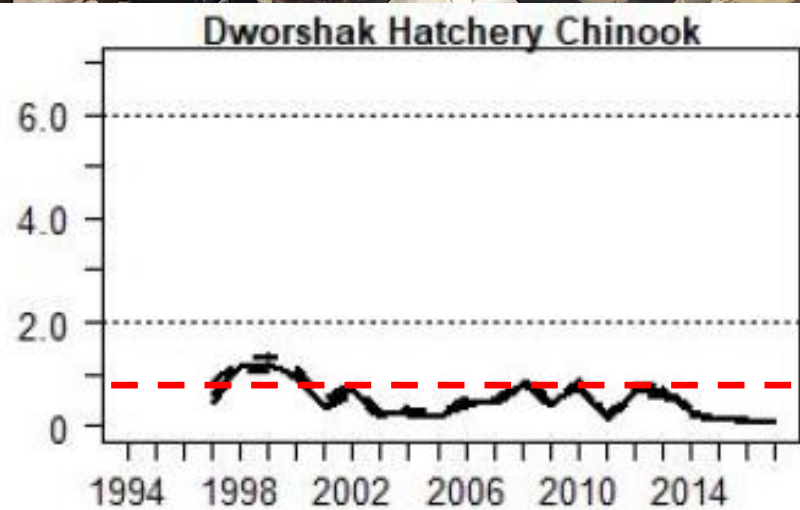
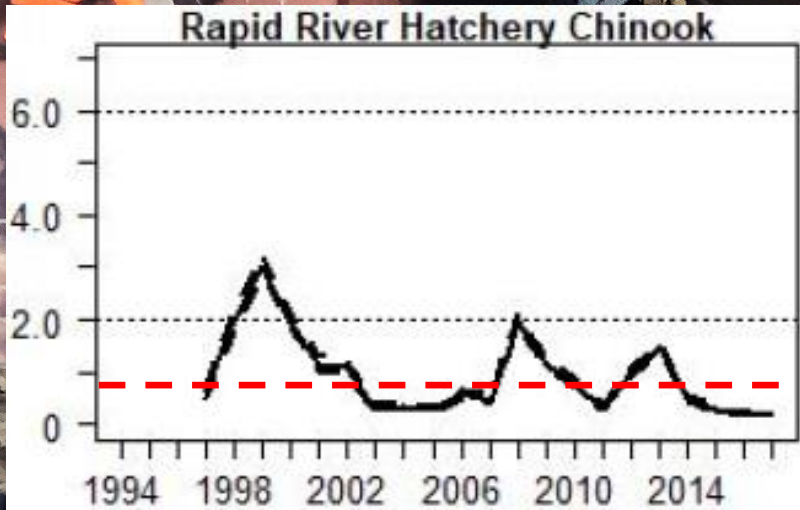
- SARs encompass several years
- Account for many hazards
- Determine adult numbers in Idaho
- Directly relate to population resilience





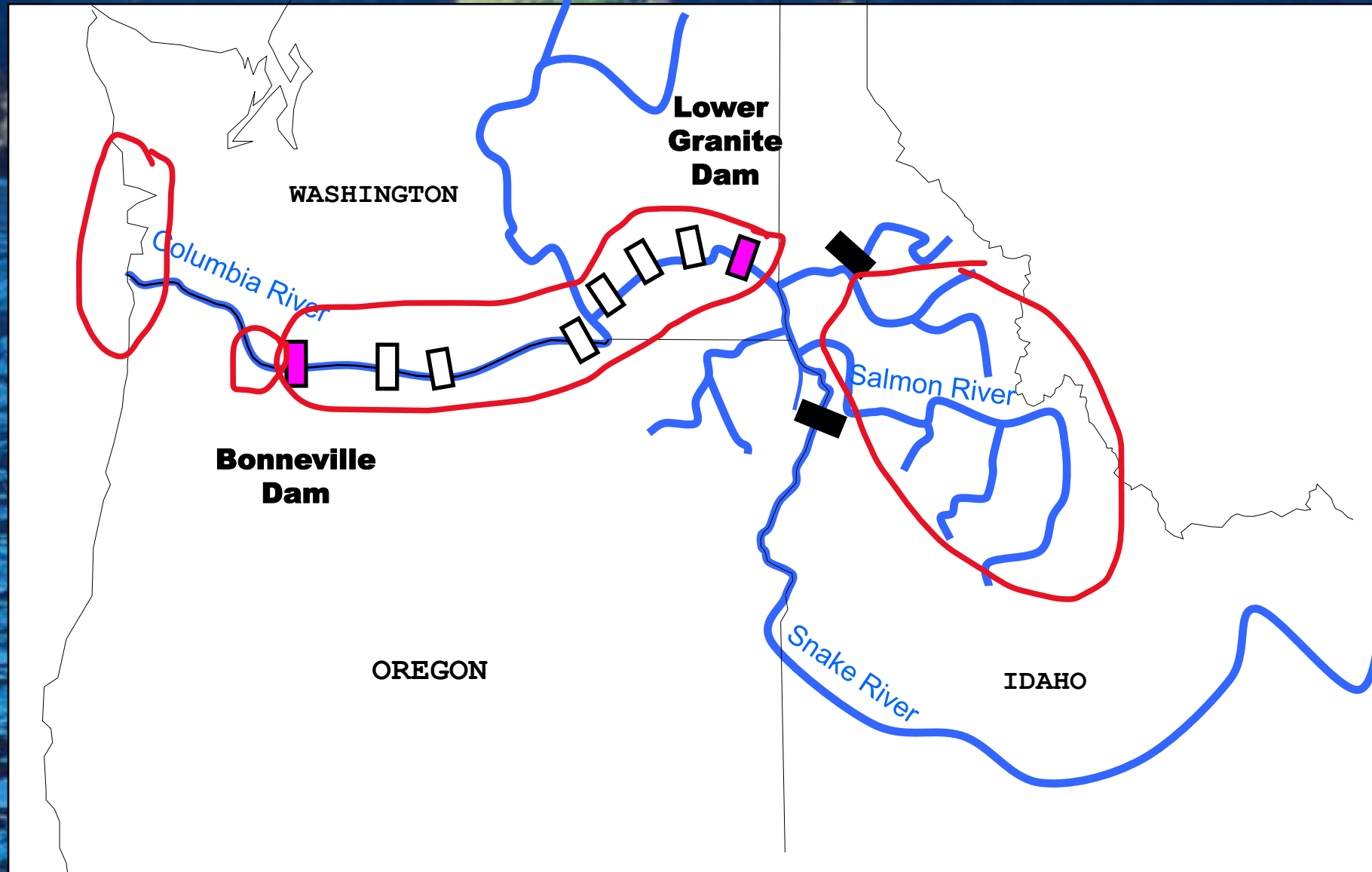


# Hatchery fish need 0.87% SAR to meet mitigation goals





# What is killing our fish?





# What is killing our fish? What causes are natural? What can we change?

Bar represents 100% fish mortality for spring chinook

Spawning ground (Lemhi) to LGD: 29%

Outward hydro system mortality

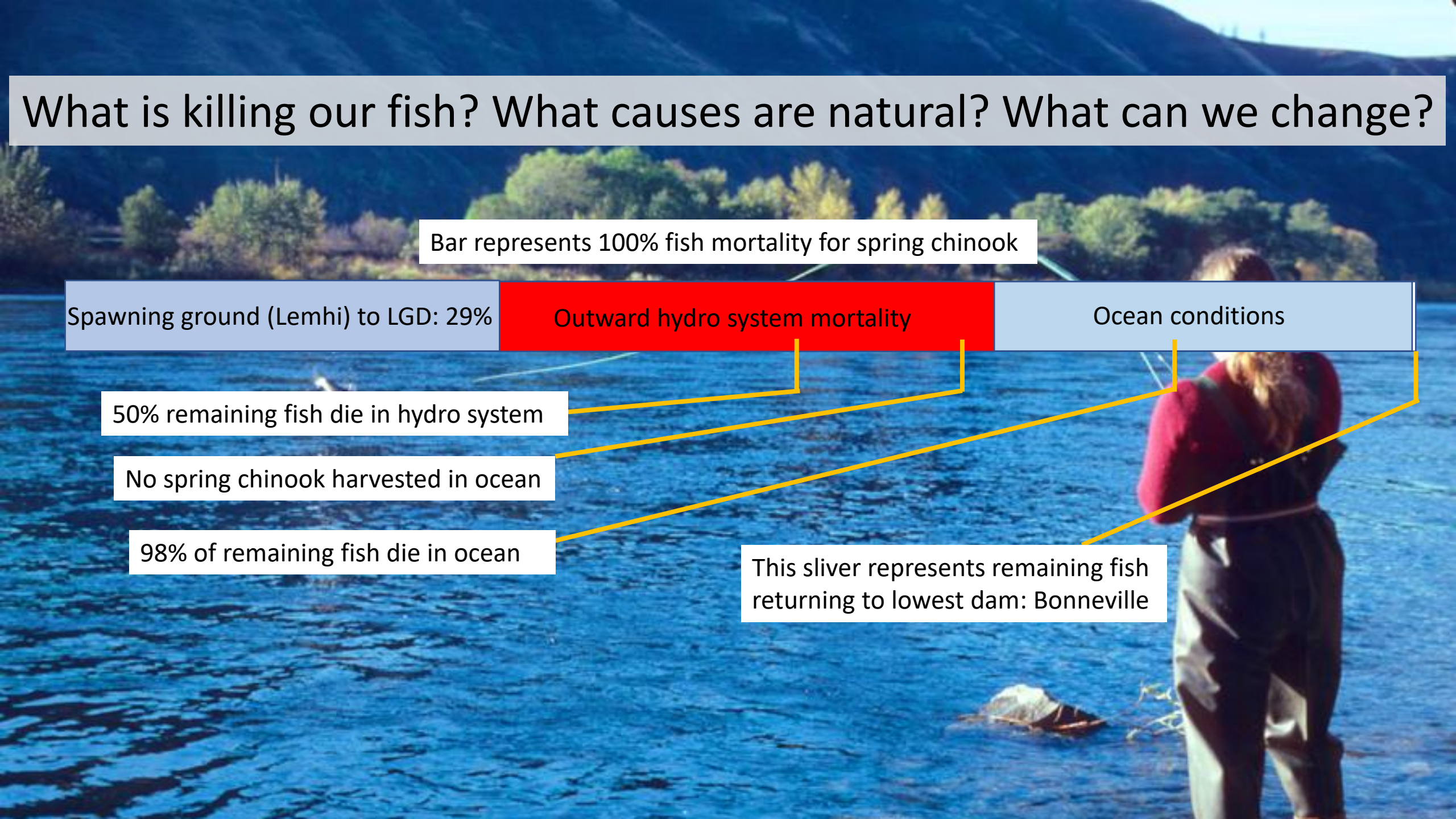
Ocean conditions

50% remaining fish die in hydro system

No spring chinook harvested in ocean

98% of remaining fish die in ocean

This sliver represents remaining fish returning to lowest dam: Bonneville





# What is killing our fish? What causes are natural? What can we change?

Bar represents 100% fish mortality for returning spring chinook

Sea lions 15-30%

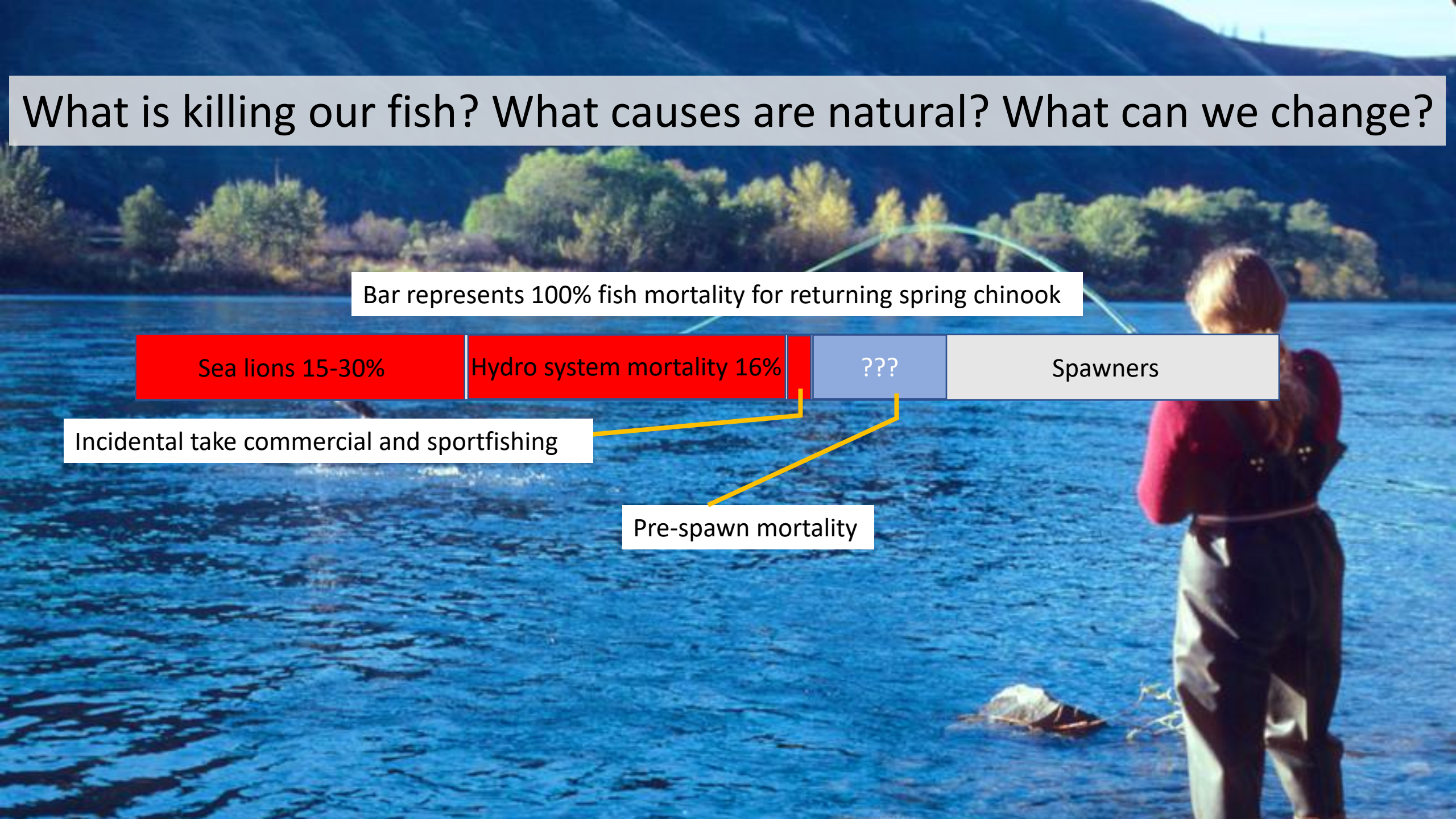
Hydro system mortality 16%

???

Spawners

Incidental take commercial and sportfishing

Pre-spawn mortality





# Perspective

Spawning ground (Lemhi) to LGD: 29%

Outward hydro system mortality

Ocean conditions

Bar represents 100% fish mortality for spring chinook

Spawning ground (Marsh Cr) to LGD: 74%

Outward hydro mortality

Ocean conditions

When applied to hatchery fish this sliver indicates:

- All tribal harvest
- All sportfishing harvest
- All sea lion harvest



A person wearing camouflage clothing is holding a large rainbow trout in shallow water. The fish has a vibrant pinkish-red stripe along its side and a white belly. The person's hands are visible, one near the head and the other near the tail. The background shows the person's torso and legs in camouflage gear.

# Flagrant claims of fish mortality

- Ocean harvest (Asia or “offshore”)
- Gillnetting on Columbia
- Sea lions\*
- Tribal harvest



The background image shows a person wearing a camouflage-patterned wetsuit, likely a diver or fisherman, holding a large, silvery fish with a pinkish-red stripe along its side. The person is wearing a blue cap with an orange logo. The scene is set in water, with ripples visible around the fish. The text is overlaid on semi-transparent grey boxes.

# The biggest impacts

- Hydro system
  - Water transport time
  - Powerhouse interactions
  - Artificial predation
  - Warm water

- Ocean conditions
- Climate change
- Habitat



A person wearing camouflage clothing is holding a large, silvery fish with dark spots, likely a salmon, over a body of water. The background is slightly blurred, showing more of the person's gear and the water.

# We can only do something about...

- Hydro system

- Water transport time
- Powerhouse interactions
- Artificial predation
- Warm water

- Ocean conditions
- Climate change
- Habitat



A person wearing camouflage clothing is holding a large salmon in shallow water. The fish is silvery with a pinkish-red hue on its side. The person's hands are visible, holding the fish from below. The background shows the person's torso and arms in camouflage gear.

What does science say will get us to  
“Recovery SARs” or healthy and harvestable?

- We need holistic approach
- Water Transport Time and Powerhouse Interactions identified as largest mortality contributor.



A person wearing a camouflage jacket is holding a large, silvery fish in a river. The background shows the flowing water and the person's hands holding the fish. The text is overlaid on a semi-transparent grey box.

What does science say will get us to  
“Recovery SARs” or healthy and harvestable?

- Breaching dams will solve:
    - Water Transport time
    - Powerhouse interaction
    - Artificial predation
    - Warm water issues
- \*Recognized by Mike Simpson



# A new era for BPA and Snake River Hydro

## Bonneville Power Administration

- Established in 1937
- Provide electricity to NW people at cost
- Sells and delivers power generated by 31 sources: dams, solar, nuclear, wind
- Including 4 Snake River dams



# Bonneville Power Administration

## “Whoops” in the 1970’s

- BPA made wildly inaccurate power forecasts
- Built too much infrastructure (2x as needed)
- Resulting in \$2.25 billion bond default known as “Whoops” ( in reference to Washington Public Power Supply System)



# Bonneville Power Administration

## Northwest Power Planning Act of 1980

- Faced with crisis, congress swooped in
- Saved BPA and turned it into piggy bank
- Responsible for salmon mitigation
  - Must not harm salmon
- \$17 billion spent for salmon and rising
- No accountability



# Bonneville Power Administration

What once was...

- For a long time BPA was a power monopoly
- No money from congress. Supposed to be self-sustaining
- The bottom is falling out of the wholesale energy market (solar, wind, natural gas, efficient power grid)



# Bonneville Power Administration

## The new problem

- BPA charges \$36/mwh
- But BPA produces 2x the power needed
- BPA sells the remaining 50% as surplus to keep costs low for primary customers
- Competitors sell power at \$22/mgh



# Bonneville Power Administration

The new problem (continued)

- BPA's customers are leaving
- \$15 billion in debt
- Burned through \$900 million in cash reserves
- Raised costs 30% to pay its debts
- Credit rating agency downgraded BPA to "negative" (Update: downgraded again in Feb.)



# Bonneville Power Administration

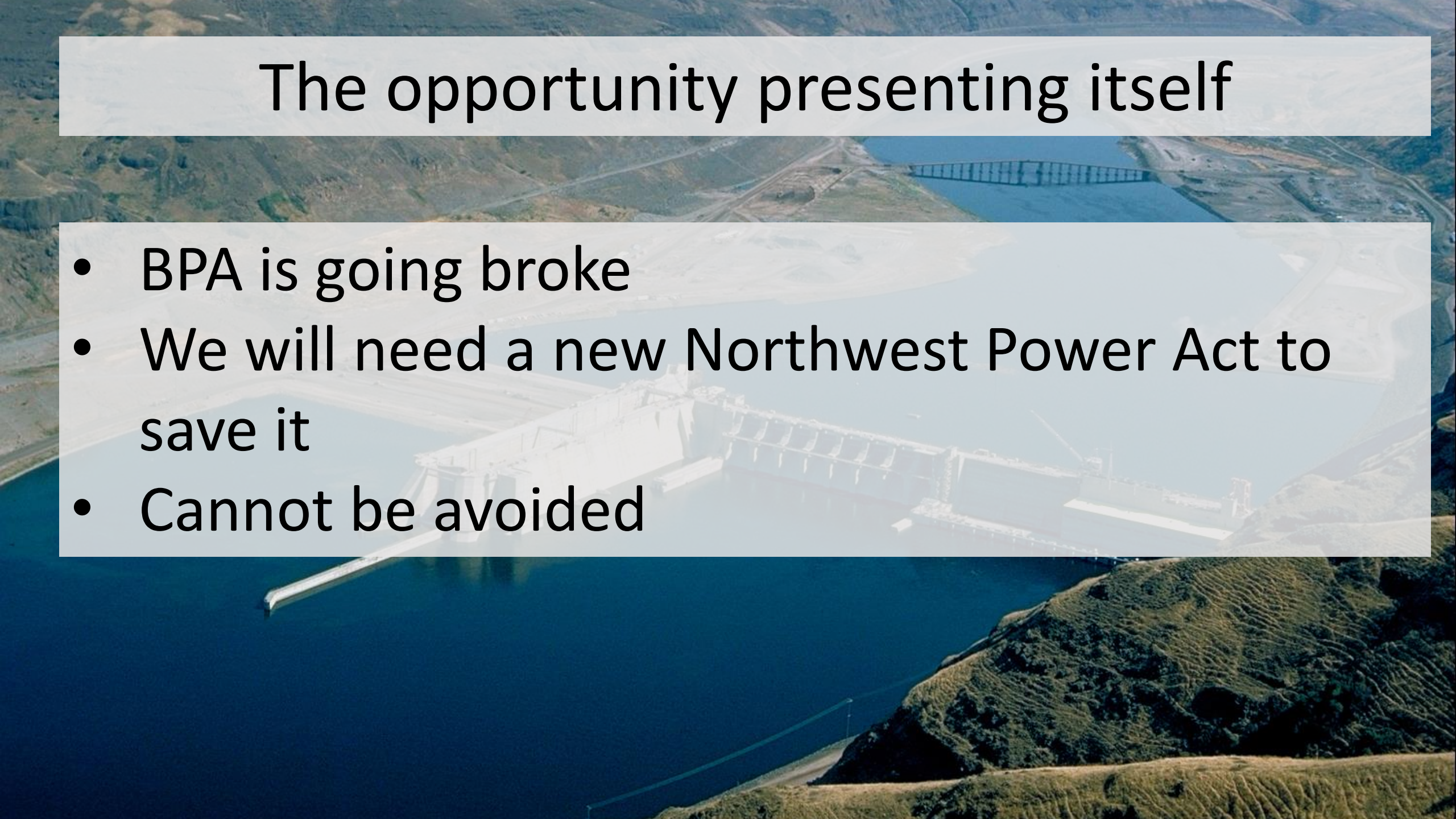
The new problem (continued)

- BPA's debt to US Treasury is capped at \$7.7b
- It's burned through \$5b and will reach cap by 2023 (based on their own projections)



# The opportunity presenting itself

- BPA is going broke
- We will need a new Northwest Power Act to save it
- Cannot be avoided



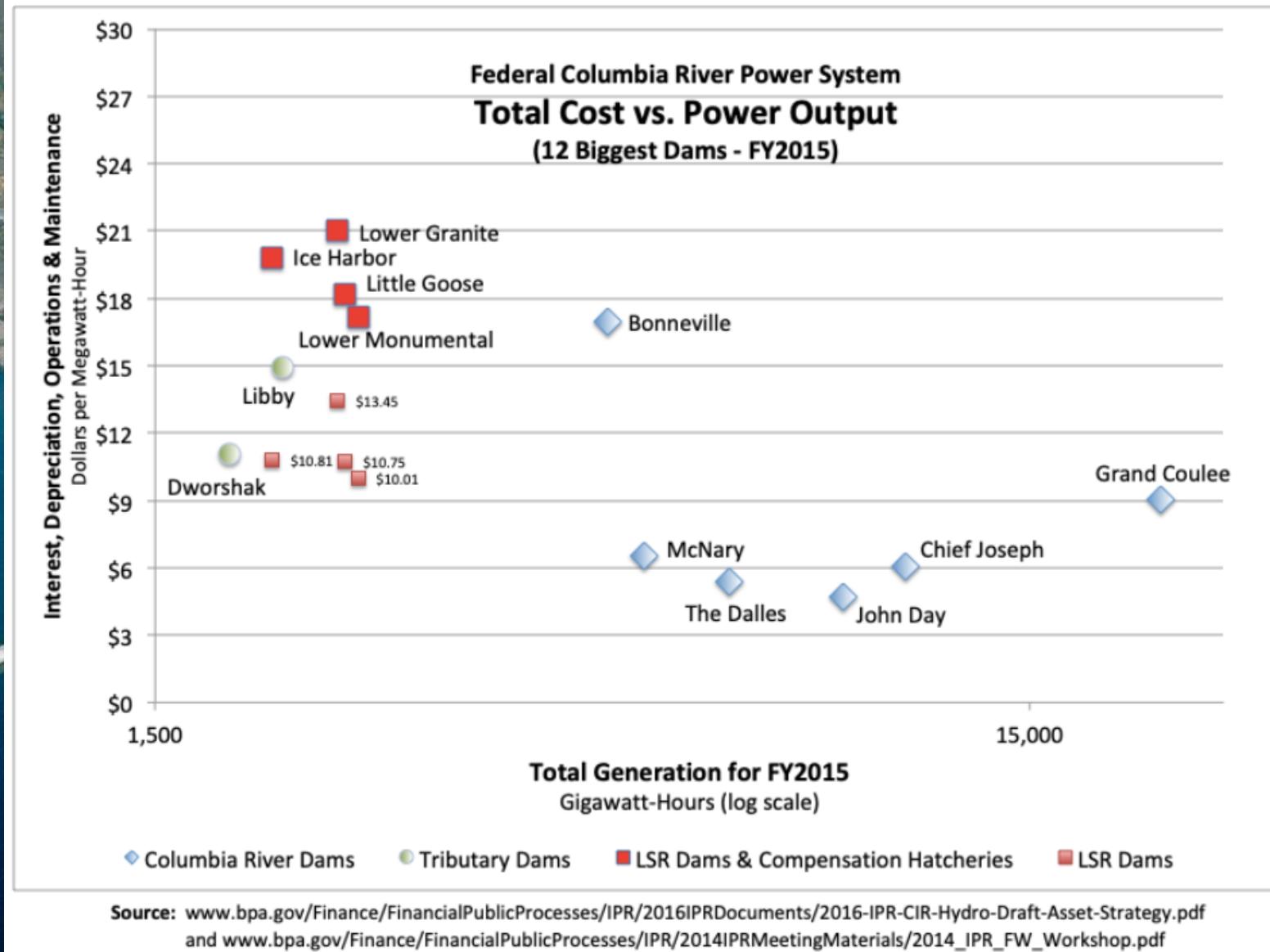


# The opportunity presenting itself

- The opportunity is to 'fix' BPA in a way that benefits people and fish, make financially solvent
- BPA must be retrofitted with efficient assets
- NW has consolidated power in congress and can direct the change



# Cost vs. Power Production of BPA's Assets





# The CRSO DEIS

- In 2016, 9<sup>th</sup> Circuit Court found CRSO was not meeting their obligation to recover salmon
- Mandated review of CRSO salmon recovery plan
- One Alternative required looking at dam breaching



# The CRSO DEIS



**Table 1: Summary of Regional and Other Social Effects.**

Resource	Social Welfare Evaluation	No Action	Preferred Alternative	MO3
Hydropower (power and transmission)	Replacement energy cost	13,000 aMW generation	\$25 million annual cost	\$270 million to \$540 million annual cost
Recreation	Recreation consumer surplus	No change from recent historic conditions, 2.7 million visitors to lower Snake River	\$2,000 annual cost (lost benefit)	<b>Short term</b> \$8.9 million to \$26 million annual cost, <b>Long term</b> river recreation to 50 percent lower to 30 percent higher visitation
Irrigation	Agriculture production (lost value)	No change from recent historic conditions, 48,000 irrigated acres from lower Snake River	No change	\$12.3 million to \$17.0 million annual cost
M&I Water Supply	Modification costs	No change from recent historic conditions, 2.4 million tons of downbound grain on lower Snake River	No change	\$4.9 million to \$7.6 million annual cost
Navigation & Transportation	Change in shipping cost	No change from recent historic conditions	\$93,000 decrease annual cost	\$14 million to \$48 million annual cost
Fisheries	Qualitative assessment	Consistent with historic conditions	Minor decreases or increases to social welfare benefits could occur	Social welfare benefits to fisheries may occur
Flood Risk Mgt.	Hazard analysis	Consistent with historic conditions	No change	No change



# The CRSO DEIS



Table 2: Summary of predicted annual SARs for Snake River spring Chinook, evaluated by two models.

<div><div><b>SNAKE RIVER SPRING CHINOOK SALMON</b> Anadromous Fish</div><div> Chinook Salmon</div></div>					
Absolute & Relative to NAA Values					
NAA	PA	MO1	MO2	MO3	MO4
CSS 57.6% LCM 50.4%	60.5%/+5% 51%/+1%	58.3%/+0.7% 51.0%/+1.1%	53.7%/-6.7% 50.1%/-0.6%	68.2%/+18.4% 60%/+19.0%	63.5%/+10.2% 50.7%/+0.7%
In-river Survival					
CSS 2.15 LCM 2.25	.98/-54% 1.2/-48%	1.74/-19.0% 1.88/-16.0%	3.48/+62.0% 3.02/+34.0%	0.56/-74.0% 0.66/-71.0%	0.34/-84.0% 0.49/-78.0%
PITPH					
CSS 2.0% LCM 0.88%	2.7%/+35% 0.81%/-7.5%	2.2%/+10.0% 0.88%/0.0%	1.4%/-30.0% 0.9%/+2.3%	4.3%/+115.0% 1.0%/+13.6%	3.5%/+75.0% 0.8%/-12.5%
SARS					



# The CRSO DEIS

**Table 3: Summary of predicted annual SARs for Snake River steelhead, evaluated by two models.**

<div><div><b>Sneke River Steelhead</b> Anadromous Fish</div><div>Steelhead</div></div>					
Absolute & Relative to NAA Values					
NAA	PA	MO1	MO2	MO3	MO4
CSS 57.1% LCM 42.7%	64.5%/+7.4% 42.8%/+0.0%	58.8%/+2.9% 42.2%/-1.1%	44.4%/-22.2% 40.2%/-6.0%	83.1%/+45.5% 52.7%/+23.3%	73.7%/+29.1% 43.1%/+0.1%
In-river Survival					
CSS 1.96 LCM 1.73	0.88/ -35% 0.93/ -46%	1.64/-16.3% 1.47/-14.7%	3.26/+66.3% 2.26/+30.8%	0.46/-76.5% 0.42/-75.6%	0.28/-85.7% 0.35/-79.9%
PITPH					
CSS 1.8% LCM N/A	2.3% +28% LCM N/A	1.9%/+5.6% N/A	1.3%/-27.8% N/A	5.0%/+177.8% N/A	3.1%/+72.2% N/A
SARS					



# "The Tale of Two Crises"

Salmon extinction  
imminent

BPA financial crisis  
imminent

## Solutions:

- Increase water transport time
- Stop powerhouse interactions
- Habitat improvement in natal streams and migration corridor
- Cull warm water, invasive predators
- Keep water cold

## Solutions:

- Reduce costly, large assets
- Reduce spending on fish mitigation (by investing in real improvements for recovery)
- Diversify power generation with smaller, less costly assets



That was a lot of info! Questions?





